

Biology 2e Release Notes 2020

Revision Number

9 8 7 6 5 4 3 2 1

Page Count Difference

In the latest edition of *Biology 2e* there is a page count reduction from 1576 pages to 1445 pages due to errata changes and the introduction of a new design.

Errata:

Below is a table containing submitted errata, and the resolutions that OpenStax has provided for this latest text.

Location / Assessment Number	Detail	Resolution Notes	Error Type
Chapter 01	The quote below from Chapter 1 (page 11) on the process of science is incomplete, as STATISTICAL ANALYSIS OF DATA IN DATABASES or DATA RESEARCH has become increasingly important in testing hypotheses, not just scientific experiments. With the huge amounts of data that increase exponentially every year, this aspect of the scientific method will become increasingly important.	Revise text to add the following to the end of the last paragraph: In recent years a new approach of testing hypotheses has developed as a result of an exponential growth of data deposited in various databases. Using computer algorithms and statistical analyses of data in databases, a new field of so-called "data research" (also referred to as "in silico" research) provides new methods of data analyses and their interpretation. This will increase the demand for specialists in both biology and computer science, a promising career opportunity.	General/pedagogical suggestion or question
Chapter 01.1	Your definition of biology is more reflective of the definition of an ecosystem. This is what you have "In simple terms, biology is the study of living organisms and their interactions with one another and their environments." This is then followed by the statement, "This is a very broad definition..." This is a VERY NARROW definition of this term. A more accurate and very broad definition would be "Biology is the study of life." You can then add in a description of "Biologists may study anything from the microscopic or submicroscopic view of a cell to ecosystems and the whole living planet.", which you currently have in the textbook. Do a quick search of any website or textbook. You will find that they all define biology simply as "the study of life".	This definition was already corrected in webview.	Other

Chapter 01.1	<p>I would like to request a change in the definition a a gene. In the intro of the book a gene is defined as: The gene is the basic unit of heredity.</p> <p>I would like to request that the definition be changed to a sequence of DNA that codes for a functional product.</p>	<p>Revise the sentence beginning "The gene is the basic..." to "The gene is the basic unit of heredity represented by a specific DNA segment that codes for a functional molecule."</p>	<p>General/pedagogical suggestion or question</p>
Chapter 01.1	<p>The Visual Connection question with figure 1.6 is written in such a way as to be confusing. The separate lists strike many people as an error. Is there a way to make this question more clear?</p> <p>Note that the same question is repeated in the Visual Connection Questions section.</p>	<p>This content will be reformatted for clarity.</p>	<p>General/pedagogical suggestion or question</p>
Chapter 01.1, Chapter 12.1, table 12.3	<p>Submitted by Customer Support on behalf of user, case 00033167</p> <p>All these errors are from the Biology, 2nd edition textbook.</p> <p>In Chapter 1, Section 1.1, and the Key Terms for Chapter 1, the definition of biology you have provided ("...the study of living organisms and their interactions with one another and their environments.") is more consistent with the definition of ecology. A more general definition such as "Biology is defined as the scientific study of life." might be more applicable.</p> <p>In Chapter 12, Section 12.1, Probability Basics, the last sentence in the paragraph located just after Table 12.2 reads "For example, consider how the product rule is applied to the dihybrid cross: the probability of having both dominant traits in the F2 progeny is the product of the probabilities of having the dominant trait for each characteristic, as shown here:..." It would be helpful to remind students of the dominant traits by adding a short phrase to the sentence For example, "...consider how the product rule is applied to the dihybrid cross: the probability of having both dominant traits in the F2 progeny is the product of the probabilities of having the dominant trait (yellow and round) for each characteristic..."</p> <p>In Chapter 12, Section 12.1, Probability Basics, the sentence just before Table 12.3 reads "Again, the sum rule can be applied to</p>	<p>In Chapter 1, revise "In simple terms, biology is the study of living organisms and their interactions with one another and their environments" to "In simple terms, biology is the study of life." Also revise the key term definition of biology to "the study of life".</p> <p>In Chapter 12, revise "...the probability of having both dominant traits..." to "...the probability of having both dominant traits (for example, yellow and round)..."</p> <p>Also revise "Again, the sum rule can be applied to show the probability of having just one dominant trait..." to "Again, the sum rule can be applied to show the probability of having at least one dominant trait..."</p>	<p>General/pedagogical suggestion or question</p>

	show the probability of having just one dominant trait in the F2 generation of a dihybrid cross: $3/16 + 3/4 = 15/16$ " This calculation is not correct for the sentence as presented. It would be correct if the sentence read "...having at least one dominant trait in the F2 generation..." For sentence as written, ("...having just one dominant trait in the F2 generation...") the calculation would be $3/16 + 3/16 = 6/16$ or $3/8$.		
Chapter 01.2	<p>Under the "Properties of Life" section the text lists 8 properties including "Adaptation", but unlike every other property listed there is no section elaborating on "Adaptation". I hope this is just a simple omission of the "Adapation" section which can be found in the earlier "Concepts of Biology" openstax book.</p> <p>Please do not remove "adaptation" from the list to fix the problem.</p> <p>As it stands in my course I am assigning the introductory chapter from "Concepts of Biology" because of its inclusion of "Adaptation" instead of the introductory chapter from "Biology 2E" because of the current omission.</p>	<p>The adaption section will be added to Biology 2e: Adaptation All living organisms exhibit a "fit" to their environment. Biologists refer to this fit as adaptation, and it is a consequence of evolution by natural selection, which operates in every lineage of reproducing organisms. Examples of adaptations are diverse and unique, from heat-resistant Archaea that live in boiling hot springs to the tongue length of a nectar-feeding moth that matches the size of the flower from which it feeds. All adaptations enhance the reproductive potential of the individuals exhibiting them, including their ability to survive to reproduce. Adaptations are not constant. As an environment changes, natural selection causes the characteristics of the individuals in a population to track those changes.</p>	Other
Chapter 01.2	Revise definition of evolution.	Revise the definition of evolution to "the process of gradual change in a population or species over time."	General/pedagogical suggestion or question
Chapter 01.2	Regulation and homeostasis are basically the same thing, or if they are not you do not explain at all how they are not. Also consider including either heredity or evolution as a characteristic of life.	This section will be revised to classify them as the same thing, and a paragraph on evolution will be added.	General/pedagogical suggestion or question
Chapter 02	The periodic table as Al (Aluminum) listed as Sodium.	This error has been corrected.	Other factual inaccuracy in content
Chapter 02	You've got a typo on a slide for biology2e chapter 2. The slide says FIGURE 2.7 - ELECTRONS FILLING THEIR SHELLS and it shows an abbreviated representation of the periodic table. The problem is that Ar is shown with the same number of electrons as Cl.	This slide will be updated.	Other factual inaccuracy in content

Chapter 02 Key Terms	<p>The glossary at the end of this section defines buffer as the following: substance that prevents a change in pH by absorbing or releasing hydrogen or hydroxide ions.</p> <p>I think the use of the word 'prevent' in this definition is inaccurate. As buffers don't prevent changes in the pH they resist changes in pH.</p>	Revise the definition for buffer to "substance that resists a change in pH by absorbing or releasing hydrogen or hydroxide ions"	Other factual inaccuracy in content
Chapter 02 section on pH	"forming hydronium ions (H ₃ O ⁺). Still", note that the numeral 0 was used instead of a capital O in the hydronium formula.	Thank you for your submission. This typo has been corrected.	Typo
Chapter 02.1	<p>I was looking at the Periodic Table in the Biology 2e book, and I noticed several errors. For example, Nitrogen is listed as Carbon, Aluminum is identified as Sodium, Calcium is identified as Potassium, Selenium is listed as Arsenic and Strontium is listed as Rubidium. I thought I should bring this to your attention.</p> <p>Case #30000</p>	Replaced table image.	Other factual inaccuracy in content
Chapter 02.1	<p>Second paragraph, spelling error:</p> <p>"...Molecular oxygen, alternatively, as Figure 2.10 shows, consists of two doubly bonded oxygen atoms and is not classified as a compound but as a hononuclear molecule."</p> <p>Believe this should be:</p> <p>"...Molecular oxygen, alternatively, as Figure 2.10 shows, consists of two doubly bonded oxygen atoms and is not classified as a compound but as a homonuclear molecule."</p>	Revise to "homonuclear."	Typo
Chapter 02.1	<p>When this happens, a weak interaction occurs between the hydrogen's δ^+ from one molecule and another molecule's δ^- charge on the more electronegative atoms, usually oxygen or nitrogen, or within the same molecule.</p> <p>Ambiguous: It is ambiguous that δ^- charge is in another molecule or in the the same molecule. This sentence could be "... and δ^- charge on another molecule with the more electronegative atoms, usually oxygen or nitrogen, or within the same molecule."</p> <p>https://openstax.org/books/biology-2e/pages/2-1-atoms-isotopes-ions-and-molecules-the-building-blocks</p>	Revise "...from one molecule and another molecule's δ^- charge on the more electronegative atoms, usually oxygen..." to "...from one molecule and the molecule's δ^- charge on another molecule with the more electronegative atoms, usually oxygen..."	General/pedagogical suggestion or question
Chapter 02.1	Main article says "In the periodic table in Figure 2.5, [...], as well as its atomic number of six (in the upper left-hand corner) and its atomic mass of 12.11."	Revise "12.11" to "12.01" in the text right before Figure 2.5.	Typo

	<p>But, in Figure 2.5, the atomic mass of carbon is represented as 12.107. It would be helpful to uniform the numbers.</p> <p>https://openstax.org/books/biology-2e/pages/2-1-atoms-isotopes-ions-and-molecules-the-building-blocks</p>		
Chapter 02.1	<p>Open sentence is "Another way to satisfy the octet rule by sharing electrons between atoms to form covalent bonds."</p> <p>Should be:</p> <p>"Another way to satisfy the octet rule is by sharing electrons between atoms to form covalent bonds."</p>	Revise to "Another way to satisfy the octet rule is by sharing..."	Typo
Chapter 02.2	/l/ice_lattice2 redirects to a 404	This link will be updated. The reference to the old link will also be deleted.	Broken link
Chapter 02.2 subsection on pH	<p>"The pH of a solution indicates its acidity or alkalinity."</p> <p>This is not quite accurate. pH shows acidity or basicity. Basicity refers to the concentration of OH⁻ ions in the solution. Alkalinity refers to the acid neutralization potential of a solution. They are similar but not the same.</p> <p>A .1M solution of NaOH will be more basic, but less alkaline than a .2 solution of NaHCO₃.</p> <p>Reference http://ion.chem.usu.edu/~sbialkow/Classes/3650/Alkalinity/Alkalinity.html</p>	Revise "alkalinity" to basicity".	Other factual inaccuracy in content
Chapter 02.3	<p>Customer Support reporting errata, Case # 40211.</p> <p>At the end of chapter 2 in the OpenStax Biology book, Figure 2.28 mislabels the guanine structure as 'Adenine.'</p>	This issue was addressed in another report and is correct in webview.	Typo
Chapter 02.3	<p>Typo: isobutene to isobutane</p> <p>https://openstax.org/books/biology-2e/pages/2-3-carbon</p>	Revise "isobutene" to "isobutane".	Typo
Chapter 02.3 Carbon	The caption of Figure 2.21 is missing a comma after "ethene" (or we could delete the comma after "double bonds")	Revise the caption to "...ethene,..."	Typo
Chapter 02.3 Carbon	"So far, the hydrocarbons we have discussed have been aliphatic hydrocarbons, which consist of linear chains of carbon atoms. Another type of hydrocarbon, aromatic hydrocarbons, consists of closed rings of carbon atoms. We find ring structures in hydrocarbons, sometimes with the presence of double bonds, which we can see by comparing cyclohexane's structure to benzene in Figure 2.23."	Revise "Another type of hydrocarbon, aromatic hydrocarbons, consists of closed rings of carbon atoms. We find ring structures in hydrocarbons, sometimes..." to "Another type of hydrocarbon, aromatic hydrocarbons, consists of closed rings of carbon atoms with alternating single and double bonds. We find ring structures in	Other

	This is confusing. It's not wrong per say but it's very easy to misinterpret. It makes it sound like cyclohexane is aromatic when it is aliphatic. Aliphatic hydrocarbons can be cyclic as hydrocarbons are only aromatic when pi bond conjugation occurs. This section makes it sound as if all cyclic hydrocarbons are aromatic.	aliphatic hydrocarbons, sometimes..."	
Chapter 03	Question stems for visual connections in the chapter body have been updated from the 1e stems, but the visual connection stems in the end-of-chapter exercises have not been updated. This affects questions 2 and 3, which were updated in 2e. - nicolas	Our reviewers accepted this change.	Typo
Chapter 03 Biological Macromolecules, Critical Thinking Questions #23	image wrapping inline with text instead of appearing below	This was a CSS issue that does not apply to the current content generatino.	Other
Chapter 03 Biological Macromolecules, Review Questions #17	"being" in question stem is almost certainly meant to say "begin".	Our reviewers accepted this change.	Typo
Chapter 03.1 Link to Learning for dehydration synthesis and hydrolysis	Unable to access the .swf file format.	We are in the process of updating the link.	Broken link
Chapter 03.1, 28.2, 36.3, and 41.2	When you click the Link to Learning link, it doesn't open an animation, but instead starts downloading an SWF file.	These links will be updated.	Broken link
Chapter 03.2	There's an extra "the" in this section. The text says "Plants are able to synthesize glucose, and they store the excess glucose, beyond the their..."	Delete the extra "the" that appears before "their."	Typo
Chapter 03.2	the statement that a low carbohydrate diet is "not sensible" is opinionated. In fact it's factually incorrect.	Revise "A low-calorie diet that is rich in whole grains, fruits, vegetables, and lean meat, together with plenty of exercise and plenty of water, is the more sensible way to lose weight." to "A well balanced diet that is rich in whole grains, fruits, vegetables, and lean meat, together with plenty of exercise and plenty of water where the calorie intake is lower than the calorie expenditure, is a more sensible way to lose weight.	Other factual inaccuracy in content
Chapter 03.3	A phosphate group alone attached to a diacylglycerol does not qualify as a phospholipid. Typo:diacylglycerol to diacylglycerol https://openstax.org/books/biology-2e/pages/3-3-lipids	Revise "diacylglycerol" to "diacylglycerol".	Typo
Chapter 03.4	Broken Image in Visual Connection. Figure 3.23	This figure is appearing correctly in webview.	Other
Chapter 03.4	Figure 2. list the 20 different amino acids as either positively charged, negatively charged, polar, or nonpolar. Proline is listed as polar R groups but is recognized as	This figure will be updated.	Other factual inaccuracy in content

	<p>nonpolar in every other text or online resource I can find. I'm wondering if some new research has reclassified this or was this just a mistake in the book? Proline has no polar R-group so I'm unsure why it would be classified as polar.</p> <p>Thanks</p>		
Chapter 03.5	<p>The 5' and 3' ends of the mRNA are reversed. On the left, near what is labeled 3', a charged tRNA is entering the ribosome. Near what is labeled the 5' end, a tRNA without an amino acid is leaving.</p> <p>These labels need to be flipped.</p>	This figure will be updated.	Other factual inaccuracy in content
Chapter 03.5	<p>The structure of Guanine has an error. The image is in the upper part of the figure. The structure for guanine shows one of the atoms as an N for nitrogen where it should be a C for carbon. That specific N is shown with a double bond to a carbon, a single bond to another carbon, and another single bond to a nitrogen. That atom should be indicated as C for carbon.</p>	This figure will be updated.	Typo
Chapter 03.5	Broken image - Figure 3.34	This figure is appearing correctly in webview.	
Chapter 05	<p>Question stems for visual connections in the chapter body have been updated from the 1e stems, but the visual connection stems in the end-of-chapter exercises have not been updated. This affects question 2 of this chapter, which has been updated in the 2e version.</p>	Our reviewers accepted this change.	Typo
Chapter 06	<p>Question stems for visual connections in the chapter body have been updated from the 1e stems, but the visual connection stems in the end-of-chapter exercises have not been updated. This affects questions 1 and 3 of this chapter, which have been updated in the 2e version.</p>	Our reviewers accepted this change.	Typo
Chapter 06.1	<p>The sentence "...cells must continually produce more energy to replenish that which the many energy-requiring chemical reactions that constantly take place use" is misleading - energy cannot be PRODUCED by the cell, it must be obtained. Energy cannot be created. Students already struggle with the misconception that mitochondria "make" energy for the cell. I suggest changing the sentence by replacing the word "produced" with either "procured" or "obtained".</p>	Revise "produce" to "obtain".	Other factual inaccuracy in content
Chapter 06.1	<p>The first sentence under Carbohydrate Metabolism currently reads "Sugar (chemical reactions) metabolism (a simple carbohydrate)..."</p>	Revise to "Sugar (a simple carbohydrate) metabolism (chemical reactions)..."	Typo

	It should read "Sugar (a simple carbohydrate) metabolism (chemical reactions)..."		
Chapter 06.1	In the third sentence, the text currently reads "...(planktonic algae perform the majority of global synthesis)". It should read "...(planktonic algae perform the majority of global photosynthesis)".	Revise "global synthesis" to "global photosynthesis".	Typo
Chapter 06.2	In Chapter 6, Section 2 (6.2), entitled Potential, Kinetic, Free, and Activation Energy, the Free Energy paragraph states the following: "Recall that according to the second law of thermodynamics, all energy transfers involve the loss of some amount of energy in an unusable form such as heat, resulting in entropy." Section 6.3, is entitled The Laws of Thermodynamics, where the Laws of Thermodynamics are actually introduced. I suggest that the positions of Sections 6.2 and 6.3 be switched as the concept has not been introduced yet. Case #27659	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	General/pedagogical suggestion or question
Chapter 06.2, 7.7, 9.4, 10.3	The following links are broken and need new targets. They may open, but have broken media, or not display at all. 6.2 - http://openstaxcollege.org/l/simple_pendulum 7.7 - http://openstaxcollege.org/l/electron_transport 9.4 - http://cnx.org/content/m66383/1.3/#eip-id1167232076592 10.3 - http://openstaxcollege.org/l/cell_checkpnts	Links will be updated as needed. The link in 10.2 was updated in report 6520.	Broken link
Chapter 06.4	The link to learning is link to a webpage with an Adobe Flash video. Adobe Flash will no longer be supported, so the video will not play.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 06.5	Last sentence in paragraph on page 193: "...Thus, when relative ATP levels are high compared to ATP, the cell is triggered to produce more ATP through sugar catabolism." Shouldn't this read, "Thus, when relative ADP levels are high compared to ATP, the	Revise from "ATP" to "ADP".	Typo

	cell is triggered to produce more ATP through sugar catabolism." ?		
Chapter 06.5	<p>The sentence in question reads:</p> <p>"On the other hand, in noncompetitive inhibition, an inhibitor molecule binds to the enzyme in a location other than an allosteric site and still manages to block substrate binding to the active site."</p> <p>I think this should be saying that a noncompetitive inhibitor binds to a location other than the active site and blocks substrates from binding at the active site.</p> <p>An example of correction would read:</p> <p>"On the other hand, in noncompetitive inhibition, an inhibitor molecule binds to the enzyme in a location other than the active site (an allosteric site) and still manages to block substrate binding to the active site."</p>	Revise "Alternatively, in noncompetitive inhibition, an inhibitor molecule binds to the enzyme in a location other than an allosteric..." to "Alternatively, in noncompetitive inhibition, an inhibitor molecule binds to the enzyme at an allosteric..."	Typo
Chapter 06.5	The link to learning links to a website with an Adobe Flash video. Adobe flash will not be supported anymore, so the video will not work.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 07	Visual Connection #3: other figure links have been updated to just say "Figure #", but the figure link for #3 is in parentheses - nicolas	Our reviewers accepted this change.	Typo
Chapter 07 Visual Connection Questions #3	Other figure links have been updated to just say "Figure #", but the figure link for Visual Connection 3 is in parentheses	This formatting issue will be resolved.	Typo
Chapter 07.2 Figure 7.6	<p>Fig 7.6</p> <p>Typo:Fructose-1,6-biphosphate to Fructose-1,6-bisphosphate</p> <p>https://openstax.org/books/biology-2e/pages/7-2-glycolysis</p>	This figure will be updated.	Typo
Chapter 07.4	7.4 Oxidative Phosphorylation reads "This causes hydrogen ions to accumulate within the matrix space. Therefore, a concentration gradient forms in which hydrogen ions diffuse out of the matrix space by passing through ATP synthase". Shouldn't this read instead "accumulate within the intermembrane space" and "diffuse out of the intermembrane space"? case #28228	Revise "matrix" to "intermembranous" and revise to "space into the mitochondrial matrix".	General/pedagogical suggestion or question
Chapter 07.7	In your biology textbook, on page 212 Figure 7.19 does not match the information in the text (which is correct). The "regulatory step 2" box should be above	Revise caption to "(1, 3, and 10)."	Other factual inaccuracy in content

	phosphofructokinase and the "regulatory step 3" box should be above pyruvate kinase. Alos, the caption for this figure should list steps "1,3, and 10" and not "1,2, and 7" as it does.		
Chapter 07.7	The link to learning takes you to the VCAC website. No video is displayed to watch. I tried to download the video and it requires you to log in or to register. There is a link to download Adobe Flash, so it may be that flash is no longer supported.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 07.7 Figure 7.19	Fig 7.19 Typo:Fructose-1,6-biphosphate to Fructose-1,6-bisphosphate https://openstax.org/books/biology-2e/pages/7-7-regulation-of-cellular-respiration	This figure will be updated.	Typo
Chapter 08	Question stems for visual connections in the chapter body have been updated from the 1e stems, but the visual connection stems in the end-of-chapter exercises have not been updated. This affects question 1 of this chapter, which has been updated in the 2e version. - nicolas	Our reviewers accepted this change.	Typo
Chapter 08	Two types of abbreviation for glyceraldehyde-3-phosphate (G3P and GA3P) is used through the chapter 8. It would be confusing. https://openstax.org/books/biology-2e/pages/8-introduction	Revise "GA3P" to "G3P".	General/pedagogical suggestion or question
Chapter 08 Visual Connection Questions	2. Figure 8.16 What is the source of electrons for the chloroplast electron transport chain? should be 2. Figure 8.16 What is the INITIAL source of electrons for the chloroplast electron transport chain? to be consistent with main article(PDF version, p.238). to be consistent with main article https://openstax.org/books/biology-2e/pages/8-1-overview-of-photosynthesis	Revise "source" to "initial source".	General/pedagogical suggestion or question
Chapter 08.3	In the reduction stage of the Calvin Cycle, there is not a proton liberated from NADPH. 3-phosphoglycerate is phosphorylated to 1,3-bisphosphoglycerate, converting ATP to ADP. This molecule is then reduced by the NADPH. It donates a hydrogen where there was formerly an oxygen on the carboxyl	This figure will be updated.	Other factual inaccuracy in content

	group, and this oxygen then bonds to the phosphate group which is liberated. See the image below. Thanks! Let me know if you accept this change.		
Chapter 08.3	The link to learning is an Adobe Flash video. Flash is no longer supported.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 09 G-protein linked receptors	The sentence that begins "Once the G-protein binds to the receptor..." should instead refer to the ligand: "Once the ligand binds to the receptor..."	Revise the sentence "Once the G-protein binds to the receptor..." to "Once the ligand binds to the receptor..."	Other factual inaccuracy in content
Chapter 09.1	In https://cnx.org/contents/jVCgr5SL@13.2:rns8-Bnk@9/Signaling-Molecules-and-Cellul the figure 1 has an white space on it's right side. It should be edited because it will cause an error in the future version of the webview.	Our reviewers accepted this change.	Other factual inaccuracy in content
Chapter 09.1	I noticed what I think may be a typo: on pg. 247, Fig. 9.6 says "GTP is hydrolyzed to GDP", but the accompanying diagram shows a GTP and Pi molecules. I was wondering if I am misunderstanding something, or if the molecule shown should be labeled GDP? I took a screenshot of the figure; the diagram I am referring to is the one at "9:00." I suppose one interpretation could be the molecule starts out as GTP in the figure, loses the phosphate group as some time progresses within the figure, and ends up as GDP in the "12:00" diagram.	Update Figure 9.6 in Biology 2e.	Typo
Chapter 09.2	According to the IUPAC, a molecule is "An electrically neutral entity consisting of more than one atom" The book refers to calcium ions as molecules, however technically they are not molecules because they are one charged atom. Source: https://goldbook.iupac.org/html/M/M04002.html	Revise "Small molecules, such as calcium ions..." to "Small molecules or ions, such as calcium ions..."	Typo
Chapter 09.4	The last link to learning video does not load in the textbook webview. Clicking the link to go to the external video does not load it either.	Our reviewers accepted this change.	Broken link
Chapter 09.4 Signaling in Single-Celled Organisms	In the Link to Learning at the end of this section: https://cnx.org/contents/jVCgr5SL@12.1:5XhJLPA5/Signaling-in-Single-Celled-Org The shortcode needs to be changed to https://www.openstax.org/l/bacteria_biofilm . Currently it is:	Shortcode has been changed & openstaxcollege links have been removed from throughout the book.	Broken link

	https://www.openstaxcollege.org/l/bacteria_bioflm		
Chapter 10 Key Terms	The term "cell cycle" is listed twice with two different definitions in the Key Terms section of chapter 10.	Delete the first "cell cycle" key term.	Other
Chapter 10.2	Fig. 4 showing animal cytokinesis indicates a contractile ring but the graphic shows four replicated chromosomes as if at a metaphase plate (Fig. 2). The diagram should be modified to show something more like a contractile ring rather than four chromosomes.	This figure will be updated.	Other factual inaccuracy in content
Chapter 10.2	Very long link. I think there's a closing tag messed up somewhere.	Our reviewers accepted this change.	Broken link
Chapter 10.2 figure 10.5	"We should note, however, that interphase and mitosis (karyokinesis) may take place without cytokinesis, in which case cells with multiple nuclei (multinucleate cells) are produced." Typo:kayrokinesis to karyokinesis https://openstax.org/books/biology-2e/pages/10-2-the-cell-cycle	Revise "kayrokinesis" to "karyokinesis".	Typo
Chapter 10.2 The Cell Cycle (https://cnx.org/contents/jVCgr5SL@8.202:SeU_rWbd@4/The-Cell-Cycle)	nicolas: Visual connection 1 shows up several paragraphs after Figure 10.6, which it's meant to accompany. anthony: "Change current art connection question to a regular end-of-section question so that it falls to the end of the section. Leave art as is. (Rationale for this approach is that the correct answer to this question can be gleaned from the art alone, but it is best after the full discussion to encourage reading. So it's best as a regular EOC question.)"	Our reviewers accepted this change.	General/pedagogical suggestion or question
Chapter 10.2 Visual Connection #1	Visual connection 1 shows up several paragraphs after Figure 10.6, which it's meant to accompany.	This will be revised to appear as a Visual Connection box with Figure 10.6 .	Other
Chapter 10.3	Link in LINK TO LEARNING - the website linked has all of it's pictures broken.	This link will be updated.	Broken link
Chapter 11 Link to Learning	Today, in reviewing the meiosis illustrations of my Biology for Majors students, I noticed one common error -- none of students drew crossing over during prophase one. Many showed it occurring during prophase II. This vital, variation-inducing step shows up only during prophase II. In the screenshot, you'll see that the description mentions crossing-over, but the results of crossing-over are not evident until the Anaphase "Event."	This issue is addressed in another report: 7112.	Other factual inaccuracy in content
Chapter 11 Review Questions	Question 6 states: "6. Which of the following is NOT true in regard to crossover?"	Revise the answer to A.	Incorrect answer, calculation, or solution

	<p>The solution manual suggests the correct answer is "chiasmata are formed" (C).</p> <p>I suggest the correct answer is "Spindle microtubules guide the transfer of DNA across the synaptonemal complex." (A).</p> <p>Our text states "Crossing over can be observed visually after the exchange as chiasmata (singular = chiasma)" (https://cnx.org/contents/jVCgr5SL@15.22:WzgNHpon@10/11-1-The-Process-of-Meiosis) and, "kinetochore" is a "protein structure associated with the centromere of each sister chromatid that attracts and binds spindle microtubules during prometaphase" (https://cnx.org/contents/jVCgr5SL@15.22:YuzE3nIj@15.22/Key-Terms). I have not found a resource that suggests "spindle" microtubules guide the transfer of DNA across the synaptonemal complex. If crossing over (or homologous recombination) happens during prophase and spindle microtubule attachment happens during prometaphase with kinetochores, then I would suggest that choice A is the correct answer.</p>		
Chapter 11.2 figure 11.9	<p>"Figure 11.9 Fungi, such as black bread mold (<i>Rhizopus nigricans</i>), have a haploid multicellular stage that produces specialized haploid cells by mitosis that fuse to form a diploid zygote. The haploid multicellular stage produces specialized haploid cells by mitosis that fuse to form a diploid zygote."</p> <p>https://openstax.org/books/biology-2e/pages/11-2-sexual-reproduction</p>	Delete the following from the caption: "The haploid multicellular stage produces specialized haploid cells by mitosis that fuse to form a diploid zygote."	General/pedagogical suggestion or question
Chapter 12 Critical Thinking Questions	<p>Question 31: I think the noun form of "epistatic" is "epistasis", not "epistatis". "epistasis" is correctly used in the answer but not the question.</p> <p>- nicolas (2e IAG overhaul)</p>	Our reviewers accepted this change.	Typo
Chapter 12 Review Questions	<p>Question 20: "Labrador retriever's fur color..." should be "Labrador retrievers' fur color..."</p> <p>- nicolas (2e IAG overhaul)</p>	Our reviewers accepted this change.	Typo
Chapter 12.1	<p>Error: '...produced offspring that had a 3:1 ratio of green:yellow seeds...'</p> <p>Suggested Correction: '...produced offspring that had a 3:1 ratio of yellow:green seeds...'</p> <p>As yellow seeds is the dominant trait in <i>Pisum sativum</i>, the order of terms in the ratio should be reversed (yellow:green instead of green:yellow)</p>	Revise "green:yellow" to "yellow:green" and revise "round:wrinkled" to "wrinkled:round".	Other factual inaccuracy in content

Chapter 12.1	<p>I think the calculation of the probability</p> $\frac{3}{16} + \frac{3}{4} = \frac{15}{16}$ <p>is incorrect. The probability of having just one dominant trait in the F2 generation of a dihybrid cross should be</p> $[(\frac{1}{4}) \times (\frac{3}{4})] + [(\frac{3}{4}) \times (\frac{1}{4})] = \frac{3}{16} + \frac{3}{16} = \frac{6}{16} = \frac{3}{8}$ <p>https://openstax.org/books/biology-2e/pages/12-1-mendels-experiments-and-the-laws-of-probability</p>	This equation will be updated.	Other factual inaccuracy in content
Chapter 12.2	<p>It's not clear if individuals II-1 and II-2 are the parents of the third generation or if they are brother and sister. My guess is that they are supposed to be the parents of the third generation, which means that the horizontal line above them should be moved down to connect them. However, if this the appropriate fix, then the genotype of individual III-3 would be known (Aa instead of A?).</p>	This figure will be updated.	Typo
Chapter 12.3	<p>I have attached an image of the paragraph, which states that $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4} = \frac{27}{64}$. The correct calculation is $\frac{81}{256}$.</p>	Revise "27/64" to "81/256".	Incorrect answer, calculation, or solution
Chapter 12.3	<p>I have attached an image of the paragraph, which states that $\frac{3}{4} \times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4} = \frac{27}{64}$. The correct calculation is $\frac{81}{256}$.</p>	Revise "27/64" to "81/256".	Incorrect answer, calculation, or solution
Chapter 12.3 Free Response (https://cnx.org/contents/jVCgr5SL@8.201:8Zft46As@5/Laws-of-Inheritance)	<p>Question 31: I think the noun form of "epistatic" is "epistasis", not "epistatis". "epistasis" is correctly used in the answer but not the question. - nicolas (2e IAG overhaul)</p>	Our reviewers accepted this change.	Typo
Chapter 12.3 Multiple Choice (https://cnx.org/contents/jVCgr5SL@8.201:8Zft46As@5/Laws-of-Inheritance)	<p>Question 20: "Labrador retriever's fur color..." should be "Labrador retrievers' fur color...". - nicolas (2e IAG overhaul)</p>	Our reviewers accepted this change.	Typo
Chapter 14.2	<p>The link to learning refers to a video "sequencing at speed". This is an adobe flash video and will no longer work.</p>	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 14.2	<p>I think two paragraphs (starting "The purines have ..." and "The sugar is ...", respectively) in the visual connection should not be included in the visual connection frame.</p> <p>In addition, the structure of Guanin in Fig.14.5 is wrong. Nitrogen between a six-membered ring and a five-membered ring should be carbon. (see revised figure.3.31)</p>	Figure 14.5 will be updated and these two paragraphs will be moved out of the Visual Connection box.	General/pedagogical suggestion or question

	https://openstax.org/books/biology-2e/pages/14-2-dna-structure-and-sequencing		
Chapter 14.2	deoxyribonucleotides typo:deoxynucleotides https://openstax.org/books/biology-2e/pages/14-2-dna-structure-and-sequencing	Revise "deoxyribonucleotides" to "deoxynucleotides".	Typo
Chapter 14.2 Figure 2b	The X-ray diffraction image shown is of the less common A form of DNA. It is the B form that is usually depicted when discussing Rosalind Franklin's results.	Our reviewers determined the textbook meets scope, sequence, and accuracy requirements as is. No change will be made.	Other factual inaccuracy in content
Chapter 14.3	The link to learning uses a tutorial with adobe flash. Adobe flash will no longer work.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 14.4	Figure 14.14 in the grey Biology 2e textbook is incorrect. The top strand of the lagging strand should be labeled 5' and the bottom strand of the lagging strand should be labeled 3'. So the labels on the left side of the figure should read 5' 3' 5' 3' from top to bottom, not 3' 5' 5' 3'.	Our reviewers accepted this change.	Other factual inaccuracy in content
Chapter 14.5	Epsilon polymerase is involved in the leading strand, while delta polymerase is involved in the lagging strand. In the book it says the opposite. Source: Lewin's Genes 12th edition chapters 9-12 and https://www.ncbi.nlm.nih.gov/pmc/articles/PMC322825/	This will be updated.	Other factual inaccuracy in content
Chapter 15.1	The link to learning is an Adobe Flash video. Adobe Flash no longer works.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 15.1	Structural formula of histidine is incorrect. Lower NH ⁺ should be N (see Figure 3.23). https://openstax.org/books/biology-2e/pages/15-1-the-genetic-code	This figure will be updated.	Other factual inaccuracy in content
Chapter 15.2	There are a couple Ts in the mRNA instead of Us.	This figure will be updated.	Other factual inaccuracy in content
Chapter 15.2	Someone else has already pointed out the presence of a couple Ts instead of Us in the RNA strand (errata ID 7502), but there are some other errors in this figure. Where the DNA strands are parting on the left there is a T opposite a C (the T should be shoved over a little to the right and there should be a G where it is instead). And over on the far right of the	This figure will be updated.	Other factual inaccuracy in content

	figure there are two Cs in the upper strand of DNA while only one corresponding G in the lower strand. Incidentally, this figure appears to be incorporated into Figure 15.3 and none of the errors are present in that version. So you probably already have a correct version for 15.7 around somewhere...		
Chapter 15.3	It seems like the caption for Figure 15.10 and the Visual Connection that's attached to it have been combined. The Visual Connection content (not the caption!), should read, "A scientist splices a eukaryotic promoter in front of a bacterial gene and inserts the gene in a bacterial chromosome. Would you expect the bacteria to transcribe the gene?"	The following should be moved out of the caption and into it's own paragraph in the Visual Connection box: "A scientist splices a eukaryotic promoter in front of a bacterial gene and inserts the gene in a bacterial chromosome. Would you expect the bacteria to transcribe the gene?"	Typo
Chapter 15.3 Eukaryotic Transcription (https://cnx.org/contents/jVCgr5SL@8.202:Er923r9q@5/Eukaryotic-Transcription)	nicolas: It seems like the caption for Figure 15.10 and the Visual Connection that's attached to it have been combined. anthony: The Visual Connection content (not the caption), should read, "A scientist splices a eukaryotic promoter in front of a bacterial gene and inserts the gene in a bacterial chromosome. Would you expect the bacteria to transcribe the gene?"	Our reviewers accepted this change.	Typo
Chapter 16.2	The lac repressor does not bind lactose, it binds allolactose. Furthermore, a very low rate of basal transcription does occur even when glucose is absent, CAP is bound, lactose is absent, and the lac repressor is active. Sources: Lewin's Genes XII chapter 26.4 page 753 https://www.khanacademy.org/science/biology/gene-regulation/gene-regulation-in-bacteria/a/the-lac-operon https://www.sciencedirect.com/science/article/pii/S0022283677902790	Revise "When lactose is present, it binds to the lac repressor and changes..." to "When lactose is present, its metabolite, allolactose, binds to the lac repressor and changes..." Also revise "...to process lactose if glucose was plentiful or lactose was not available" to "...to process lactose if glucose was plentiful or lactose was not available. It should be mentioned that the lac operon is transcribed at a very low rate even when glucose is present and lactose absent."	Other factual inaccuracy in content
Chapter 16.2 Prokaryotic Gene Regulation (https://cnx.org/contents/jVCgr5SL@8.202:Kcno4j3y@4/Prokaryotic-Gene-Regulation)	Visual connection 1 (in chapter): Unlike all the other Visual Connections, the question below Figure 16.5 begins with "Question:"	Our reviewers accepted this change.	General/pedagogical suggestion or question
Chapter 16.4 Enhancers and Transcription	Misspelled word- 'promoter' spelled as 'promotor.' Only found once in the PDF. It doesn't need an immediate fix.	Our reviewers accepted this change.	Typo
Chapter 16.5 Eukaryotic Post-transcriptional Gene Regulation	Video in link to learning does not show up.	Our reviewers accepted this change.	Broken link
Chapter 16.7 and 17.3	There is a couple of redirect links that are broken and need to be replaced. http://openstax.org/l/p53_cancer http://openstax.org/l/DNA_sequence	The broken links will be updated.	Broken link

Chapter 17 Visual Connection	<p>3. Figure 17.15</p> <p>The sentences "The PCA3 test is considered to be more accurate, but screening may still result in men who would not have been harmed by the cancer itself suffering side effects from treatment. What do you think? Should all healthy men be screened for prostate cancer using the PCA3 or PSA test? Should people in general be screened to find out if they have a genetic risk for cancer or other diseases?" are different from main article(PDF version, p.480).</p> <p>It should be consistent with the main article.</p> <p>https://openstax.org/books/biology-2e/pages/17-4-applying-genomics</p>	Revise "The PCA3 test is considered to be more..." to "The PCA3 test is more..."	General/pedagogical suggestion or question
Chapter 17.1	The label for "Hybridization buffer" should be "Transfer buffer." The hybridization is done after transfer of the DNA to the nylon membrane.	This figure will be updated.	Other factual inaccuracy in content
Chapter 17.1	The link to learning is an Adobe flash video. Adobe flash is no longer supported.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 17.2	Link in SCIENTIFIC METHOD CONNECTION doesn't work. When updated, this should be an openstax.org/l/ short code link .	This link will be updated.	Broken link
Chapter 17.2	The genome map viewer in the scientific method connection appears to be a bad link. I tried multiple times to access it, and it keeps saying the connection is timed out.	We are able to load the link in all browsers.	Broken link
Chapter 17.5	The bar for the DNA strand is labeled Promoter. The binding domain binds to the Enhancer/Control element/Upstream Activating Sequence (whichever you prefer). The section labeled promoter should also be separated from the target gene. Probably just a simple separation of the two colored bars with some " - - - " between them would be enough.	This figure will be updated.	Other factual inaccuracy in content
Chapter 18.1	"Visit this interactive site to guess which bone structures are homologous and which are analogous, and see examples of evolutionary adaptations to illustrate these concepts." Well you never introduce or define the term analogy, which you definitely should if you're also teaching about convergent/divergent evolution and homologous structures.	Add the following after the sentence "...hind leg bones in whales": "Not all similarities represent homologous structures. As explained in Chapter 20.2, when similar characteristics occur because of environmental constraints and not due to a close evolutionary relationship, it is an analogy or homoplasy. For	General/pedagogical suggestion or question

		example, insects use wings to fly like bats and birds, but the wing structure and embryonic origin are completely different. These are analogous structures (Figure 20.8)."	
Chapter 18.1	The first link to learning directs to a site to guess homologous structures. The website it links to is not interactive at all and simply defines homologous. Now, the page does have two pages, but if I click to page 2 of 2, it is an adobe flash animation. Adobe flash is no longer supported.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 18.2	I think there should be two pairs of green chromosomes in the final cell pictured. That is, all of the chromosomes from both gametes should be present.	This figure will be updated.	Other factual inaccuracy in content
Chapter 18.2	The link to learning is adobe flash, and adobe flash is no longer supported.	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 18.2	I have attached the summary for Chapter 18.2, which I think includes the following misstatement: For a new species to develop, something must cause a breach in the reproductive barriers. For a new species to emerge, a reproductive barrier must be introduced, not eliminated.	In the 18.2 summary, revise the sentence beginning "For a new species to..." to "For a new species to develop, something must introduce a reproductive barrier."	Other factual inaccuracy in content
Chapter 18.2 Figure 18.9	On page 264 in Concepts of Biology, the honeycreeper at the top of the page is the iiwi, not "Liwi." (Or better yet, i'iwi.) service ticket #19891	Update Figure 18.9.	Typo
Chapter 19.1	Under the subheading Population Genetics, the second sentence identifies that a "particular blood-type protein on the surface of red blood cells" determines human blood group under the ABO system. The antigens of the ABO blood group are sugars, not proteins. "The sugars are produced by a series of reactions in which enzymes catalyze the transfer of sugar units. A person's DNA determines the type of enzymes they have, and, therefore, the type of sugar antigens that end up on their red blood cells." (Dean L. Bethesda (MD): National Center for Biotechnology Information (US); 2005. https://www.ncbi.nlm.nih.gov/books/NBK2264/)	Revise text under the subheading Population Genetics to replace "blood-type protein" with "blood-type carbohydrate"	Other factual inaccuracy in content

Chapter 19.3	<p>"Natural selection only acts on the population's heritable traits: selecting for beneficial alleles and thus increasing their frequency in the population, while selecting against deleterious alleles and thereby decreasing their frequency. Scientists call this process adaptive evolution. Natural selection does not act on individual alleles, but on entire organisms. "</p> <p>This is a poorly worded paragraph as you make a point then seemingly contradict it. You say that natural selection acts on alleles, and the immediately say natural selection does not act on individual alleles. While I understand what you are trying to say, a better way of saying it might be to say evolution acts at multiple levels, including the allele, individual and population. This phrasing would not outright dismiss all of the gene-centered or multi-leveled evolutionary theories which argue natural selection acts at multiple levels including at the genetic, cellular, individual and group levels.</p> <p>Furthermore, this is a poor definition of adaptive evolution as it fails to mention the quintessential concept of adapting to the environment. Almost every other definition of this term relates adaptive evolution to being a function of the habitat and an organism's ability to adapt to it.</p>	<p>Revise the section "Natural selection only acts on the population's heritable traits: selecting for beneficial alleles and thus increasing their frequency in the population, while selecting against deleterious alleles and thereby decreasing their frequency. Scientists call this process adaptive evolution. Natural selection does not act on individual alleles, but on entire organisms" to "Natural selection acts on the population's heritable traits: selecting for beneficial alleles that allow for environmental adaptation, and thus increasing their frequency in the population, while selecting against deleterious alleles and thereby decreasing their frequency. Scientists call this process adaptive evolution. Natural selection acts on entire organisms, not on an individual allele within the organism."</p>	General/pedagogical suggestion or question
Chapter 20	<p>Question stems for visual connections in the chapter body have been updated from the 1e stems, but the visual connection stems in the end-of-chapter exercises have not been updated. This affects question 1 of this chapter, which is updated in the 2e version.</p> <p>- nicolas</p>	Our reviewers accepted this change.	Typo
Chapter 20 Visual Connection, Question 1	Question stem for Visual Connection #1 has not been updated in the visual connections section of the end-of-chapter exercises.	Revise the end-of-chapter exercises to match the visual connection question stem.	Typo
Chapter 20.1	For the link to learning at the end of the section, the link to pbs.org works. However, when I am on pbs.org and I click launch interactive, nothing happens	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 20.3	<p>"These GTAs, which are most likely bacteriophages that lost the ability to reproduce on their own..."</p> <p>Bacteriophages, and viruses in general, cannot reproduce on their own. They require a host to reproduce, and their lack of independent reproduction is a major reason they are not considered alive.</p>	Revise "These GTAs, which are most likely bacteriophages that lost the ability to reproduce on their own, carry random DNA pieces from one organism to another" to "These GTAs, which are most likely derived from bacteriophage DNA inserted in a prokaryote that lost the ability to produce new bacteriophages, carry	Other factual inaccuracy in content

		random DNA pieces from one organism to another."	
Chapter 20.3	<p>I think there might be a typo in this sentence, which is right above Figure 20.13. It says this:</p> <p>A carotenoid enzyme, or desaturase, is responsible for the red coloration in certain aphids, and when mutation activates this gene, the aphids revert to their more common green color (Figure 20.13). I think maybe it should say "...when mutation inactivates this gene, the aphids...."</p>	<p>Revise this sentence to "A carotenoid enzyme, or desaturase, is responsible for the red coloration in certain aphids, and when mutation of this gene leads to formation of inactive enzyme, the aphids revert to their more common green color (Figure 20.13)."</p>	Typo
Chapter 21.1	<p>The "self-replicating hypothesis" is the same thing as the progressive hypothesis. Many versions of the progressive hypothesis include plasmids and transposons, so really it's two terms for the same idea. Also, the virus-first hypothesis is left out entirely.</p>	<p>Revise "A second hypothesis, the escapist or the progressive hypothesis, suggests that viruses originated from RNA and DNA molecules that escaped from a host cell. A third hypothesis, the self-replicating hypothesis, suggests that viruses may have originated from self-replicating entities similar to transposons or other mobile genetic elements" to "A second hypothesis, the escapist or the progressive hypothesis, suggests that viruses originated from RNA and DNA molecules, or self-replicating entities similar to transposons or other mobile genetic elements, that escaped from a host cell with the ability to enter another. A third hypothesis, the virus first hypothesis, suggests that viruses may have been the first self-replicating entities before the first cells."</p>	General/pedagogical suggestion or question
Chapter 21.1 Table, "Virus Classification by Genome Structure"	<p>Tagging/coding is displaying in the table. The other contents are readable, but the coding is an error.</p>	<p>Markup revised.</p>	Other
Chapter 21.2	<p>Bottom link to learning - link doesn't load, tested in Poland, probably doesn't work in other countries too.</p>	<p>This link will be updated.</p>	Broken link
Chapter 21.2	<p>https://openstax.org/l/viruses redirect is broken. Needs new link.</p>	<p>This link will be updated in Biology 2e.</p>	Broken link
Chapter 22 problem sets	<p>Organisms most likely to be found in extreme environments are _____.</p> <p>fungi bacteria viruses archaea B</p> <p>https://bio.libretexts.org/Bookshelves/Intro</p>	<p>Revise the answer to D.</p>	Other factual inaccuracy in content

	<p>ductory_and_General_Biology/Book%3A_General_Biology_(OpenStax)/5%3A_Biological_Diversity/22%3A_Prokaryotes_-_Bacteria_and_Archaea/22.E%3A_Prokaryotes_-_Bacteria_and_Archaea_(Exercises)</p> <p>Archaea should be the most likely organism to be found in extreme environment. The option here should be D not B</p>		
Chapter 22.1 and answer keys	<p>The provided correct answer to the first review question is wrong. The first forms of life should be b.prokaryotes, not a.single-celled plants (which do not exist anyway). in the PRINT version of the book,</p> <p>ALL answer keys to chapters seem to be missing the odd Review Questions answers.</p>	Revise correct answer as appropriate. This is corrected in the Biology 2e textbook.	
Chapter 22.2	<p>I do not think that this table is the best way to present the different microbial metabolic modes because I think combining energy source (photo/chemo) with electron source (litho/organo) ends up being more confusing than it is helpful. I think it should either be presented fully (that every organism is an auto/hetero, chemo/photo, litho-organo -troph), or that the electron source should be omitted and simply describe 4 metabolic modes (chemoautotroph, chemoheterotroph, photoautotroph, photoheterotroph). I'm sharing a PDF that shows how I've taught this both ways (with electron donor and without). In short, the way this is presented in this table leaves out some interesting metabolic modes (photoorganotrophs, for example)</p>	This table will be updated.	General/pedagogical suggestion or question
Chapter 22.4	<p>Submitted by Customer Support on behalf of use, Case 00037769</p> <p>"Missing video (broken link) in section 22.4 of Biology 2e; I think this is the same video on Nature's YouTube Channel</p> <p>I believe that this is the same video, whose link is broken in section 22.4 of Biology 2e. Maybe the link can be updated quickly? We are assigning this chapter as reading prior to our first day of class. Otherwise, I'll tell students to use the link below instead. https://www.youtube.com/watch?v=pRZYb2Jl22g Secrets of the Black Death - by Nature Video November 11, 2011"</p>	This link will be updated.	Broken link
Chapter 23.4	Both links in Links to learning are broken . I got error 404. Links are also blocked in Europe.	These links will be updated.	Broken link

Chapter 24 Introduction	The true fungi belong to Eumycota, not Eucomycota.	Revise to "Eumycota."	Typo
Chapter 24.3	https://www.openstax.org/l/lichenland redirect is broken. Needs new link.	This link will be updated.	Broken link
Chapter 24.5	<p>Chp 24 section 5 says, "As animal pathogens, fungi help to control the population of damaging pests. These fungi are very specific to the insects they attack, and do not infect animals or plants."</p> <p>I think this would be clearer if it read "do not infect OTHER animals" since insects are animals. This confused some of my students, even though I think the meaning is clear.</p>	Revise "These fungi are very specific to the insects they attack, and do not infect animals or plants" to "These fungi are very specific to the insects they attack, and do not infect other animals or plants."	Other factual inaccuracy in content
Chapter 25.1	<p>Liverworts phylum is Marchantiophyta NOT Hepaticophyta. See https://www.itis.gov/servlet/SingleRpt/SingleRpt</p> <p>Please correct in following text and elsewhere:</p> <p>Liverworts (Hepaticophyta) are currently classified as the plants most closely related to the ancestor of vascular plants that adapted to terrestrial environments. In fact, liverworts have colonized every terrestrial habitat on Earth and diversified to more than 7000 existing species (Figure 25.9). Lobate liverworts form a flat thallus, with lobes that have a vague resemblance to the lobes of the liver (Figure 25.10), which accounts for the name given to the phylum. Leafy liverworts have tiny leaflike structures attached to a stalk. Several leafy liverworts are shown in Figure 25.9.</p>	Revise so the phylum is given as "Marchantiophyta."	Other factual inaccuracy in content
Chapter 25.1	<p>https://openstax.org/l/charophytes redirect is broken.</p> <p>Needs new link.</p>	This link will be updated.	Broken link
Chapter 25.4	Bottom LINK TO LEARNING , linked website should contain a video but there is only an ad and I can not start any video.	This link will be updated.	Broken link
Chapter 25.4 Seedless Vascular Plants	The final paragraph of the "Leaves, Sporophylls, and Strobili" section contains a redundancy (re: pine cones): "In addition to photosynthesis, leaves play another role in the life of the plants. Pine cones, mature fronds of ferns, and flowers are all sporophylls—leaves that were modified structurally to bear sporangia. Strobili are cone-like structures that contain sporangia. They are prominent in conifers and are commonly known as pine cones."	Revise "Strobili are cone-like structures that contain sporangia. They are prominent in conifers, where they are commonly known as pine cones" to "In conifers, the commonly named pine cones, strobili, are cone-like structures that contain sporangia."	General/pedagogical suggestion or question
Chapter 26	"The Triassic period was marked by the increase in number and variety of angiosperms." It should read: "The CRETACEOUS period....."	Revise to "Cretaceous".	Other factual inaccuracy in content

Chapter 26.1	<p>This figure's evolutionary relationships are correct, but some of the group names should be updated in order to bring the figure into consistency with chapter 25. For example:</p> <p>For the groups of bryophytes, the group names should match those in Chapter 25: Hapticophyta, Bryophyta, Anthocerotophyta.</p> <p>The heading for the fern group should be Monilophytes, not Pterophytes.</p> <p>And the heading for horsetails should be Equisetopsida, to match Chapter 25.</p>	This figure will be updated.	Other factual inaccuracy in content
Chapter 26.1	<p>in my Biology text CH.26.1 it says in the first /second paragraph the seen plants appeared 350 or so million years ago. The last paragraph in the book says one million.</p>	Revise the section summary to "...350 million years..."	Typo
Chapter 26.2 Gymnosperms	<p>"Characteristics of the gymnosperms include naked seeds, separate female and male gametes, pollination by wind..." Likely this was meant to say "separate male and female gametophytes" (all plants have separate male and female gametes). Also, cycads and several gnetophytes have been shown to be animal pollinated (e.g. Rydin C, Bolinder K. 2015 Moonlight pollination in the gymnosperm Ephedra (Gnetales). Biol. Lett. 11: 20140993. http://dx.doi.org/10.1098/rsbl.2014.0993)</p>	Revise "Characteristics of the gymnosperms include naked seeds, separate female and male gametes, pollination by wind, and tracheids (which transport water and solutes in the vascular system)" to "Characteristics of the gymnosperms include naked seeds, separate female and male gamtophytes, pollen cones and ovulate cones, pollination by wind and insects, and tracheids (which transport water and solutes in the vascular system)."	Other factual inaccuracy in content
Chapter 26.4 The Role of Seed Plants	<p>"An extreme example of coevolution (discovered by Dan Jansen) between an animal and a plant"</p> <p>you have misspelled the scientists name: It's Dan Janzen</p> <p>https://en.wikipedia.org/wiki/Daniel_H._Janzen</p>	Revise from "Dan Jansen" to "Daniel Janzen".	Other factual inaccuracy in content
Chapter 27.2	<p>The colors used to highlight the embryonic layers do not conform to the traditional blue for ectoderm, red for mesoderm, and yellow for endoderm. It is very disorienting. Why use the different colors? If there isn't a good reason, please use the traditional colors.</p>	These figures will be updated.	General/pedagogical suggestion or question
Chapter 27.3	<p>There is a link to learning that says: LINK TO LEARNING</p> <p>Explore an interactive tree of life here. Zoom and click to learn more about the organisms and their evolutionary relationships.</p> <p>This links to an adobe flash video that is no longer supported.</p>	Our reviewers determined this would require a significant book revision. While we cannot make this change at this time, we will consider it for future editions of this book.	Broken link
Chapter 28 key terms	<p>siphonophore</p> <p>Typo:siphon</p>	Revise the term "siphonophore" to "siphon".	Typo

	https://openstax.org/books/biology-2e/pages/28-key-terms		
Chapter 28 Visual Connection	<p>VISUAL CONNECTION QUESTIONS</p> <p>The sentence "2. a. Mollusks have a radula for grinding food." is different from main article (PDF version, p.812).</p> <p>It should be consistent with the main article.</p> <p>The sentences "3. b. Insects have spiracles, openings that allow air to enter." and "3. d. Insects have a developed digestive system with a mouth, crop, and intestine." are different from main article(PDF version, p.836).</p> <p>It should be consistent with the main article.</p> <p>https://openstax.org/books/biology-2e/pages/28-visual-connection-questions</p>	<p>In question 2, choice (a), revise "Mollusks" to "Most mollusks".</p> <p>In question 3, revise choice (b) to "Insects have spiracles, openings that allow air to enter into the tracheal system." and revise choice (d) to "Most insects have a well-developed digestive system with a mouth, crop, and intestine."</p>	General/pedagogical suggestion or question
Chapter 28.1	<p>https://openstax.org/l/id_sponges redirect is broken.</p> <p>Needs new link.</p>	This link will be updated in Biology 2e.	Broken link
Chapter 28.1	/l/sea_sponges redirects to a site the spider reports as insecure, and then treats as broken	This link will be updated.	Broken link
Chapter 28.2	redirect /l/obelia is broken. Needs a new link.	This link will be updated. The text in the Link to Learning box will also be revised to delete "and quiz".	Broken link
Chapter 28.4	In chapter 28, section 28.4 on page 818 the text states there are approximately 16,500 species in the phyla annelida. On page 820 it states there are more than 22,000 species of annelids.	Revise 16,500 to 22,000.	Typo
Chapter 29 Visual Connection	<p>Question 1. is different from main article(PDF version, p.851). It should be consistent with the main article.</p> <p>The sentences "3. Members of the order Testudines have an anapsid-like skull with one opening." are different from main article(PDF version, p.869). It should be consistent with the main article.</p> <p>https://openstax.org/books/biology-2e/pages/29-visual-connection-questions</p>	Revise "...skull with one opening" to "...skull without obvious temporal fenestrae"	General/pedagogical suggestion or question
Chapter 29.1	In this figure representing larval and adult tunicates, I think there is a labeling error. The structure labeled "Anus" is probably an atriopore. The anus should connect to the stomach. In the adult the "Anus" label is also a little misleading. Consider labelling that the "Atrial siphon" and changing the "Mouth" label to "Oral siphon." See suggested modifications in the attached file.	This figure will be updated.	Other factual inaccuracy in content

Chapter 29.5	<p>In the second line of the attached paragraph, "theropod" is spelled "therapod." It's either a typo or a spelling error, but should be "theropod." See attachment. There may well be other instances in the chapter. I'm saying this because I probably did it myself -- it's an error I commonly make. Mea culpa! And I'll do a quick search for more...</p>	Revise "therapod" to "theropod".	Typo
Chapter 29.7	<p>The caption for Chapter 29 Figure 29.46 states "This chart shows the evolution of modern humans." This wording is factually incorrect. The caption should say something like "This chart shows evolutionary relationships among Hominins, including hypothesized relationships between various extinct Hominini and modern humans, based primary on morphological evidence".</p>	Update the caption to "Hominin phylogeny. This chart shows the evolutionary relationship among Hominins and hypothesized relation to modern humans. (*still debated phylogeny position)".	Other factual inaccuracy in content
Chapter 29.7	<p>The position of family Hominidae is incorrectly labeled on the phylogenetic tree. The label Hominidae should be positioned one branch higher to include orangutans. As currently drawn, family Hominidae erroneously excludes orangutans (Pongidae). The position for subfamily Homininae is also incorrectly labeled on the phylogenetic tree. The label Homininae should be positioned one branch higher to include gorillas. As currently drawn, subfamily Homininae erroneously excludes gorillas. The position for Hominini is also incorrectly labeled on the phylogenetic tree. The label Hominini should be positioned one branch higher to include the Australopithecus anamensis. There is ongoing debate as to whether Orrorin is best considered as Hominini or "Proto-Hominini" but there is no obvious justification for placing one Australopithecus on a paraphyletic branch. The simplest fix is to move the Hominini label to include all Australopithecus, and to avoid student confusion, the labeling of Orrorin should be changed to clarify that its position is purely speculative here.</p>	This figure will be updated.	Other factual inaccuracy in content
Chapter 30 Introduction	<p>The statement quoted below implies all vascular plant have seeds, which is incorrect; "When you think of plants, most of the organisms that come to mind are vascular plants. These plants have tissues that conduct food and water, and they have seeds." Possible correction: drop "and they have seeds" or change it to "and most of them have seeds"</p>	Revise to "These plants have tissues that conduct food and water, and most of them have seeds."	Other factual inaccuracy in content

Chapter 30 Visual Connection Questions	<p>Question 1. is different from main article(PDF version, p.909). It should be consistent with the main article.</p> <p>https://openstax.org/books/biology-2e/pages/30-visual-connection-questions</p>	In question 1, revise choice (b) to "phloem" and revise choice (d) to "xylem".	General/pedagogical suggestion or question
Chapter 30.5	<p>In the AP Biology Course and Exam Description released by the College Board for the 2019-2020 school year, a formula was added to be covered in AP Biology courses, and I'd like to request that we add material to our OpenStax book that addresses this added content. The specific standard/topic included by the College Board is attached in the screenshot below.</p> <p>It's this idea of solute potential that could use some additional content in the OpenStax book. Solute potential is introduced on page 927 of the textbook (PDF page 981) but what's missing is this formula from the CED along with how to use it, so I think a short explanation of the solute potential equation along with an example of how the equation is used would be enough to address this information.</p> <p>Currently in the AP Bio crosswalk that we just added to OpenStax, we directed users to a lab activity in the College Board's lab manual that provides some material that covers this concept, but I think it'd be good for us to have the content within the actual OS book, too.</p>	<p>Revise "Solute potential (Ψ_s), also called osmotic potential, is negative in a plant cell and zero in distilled water."</p> <p>to</p> <p>"Solute potential (Ψ_s), also called osmotic potential, is related to the solute concentration (in molarity). That relationship is given by the van 't Hoff equation: $\Psi_s = -iMRT$; where M is the molar concentration of the solute, i is the van 't Hoff factor (the ratio of the amount of particles in the solution to amount of formula units dissolved), R is the ideal gas constant, and T is temperature in Kelvin degrees. The solute potential is negative in a plant cell and zero in distilled water."</p>	Other
Chapter 30.5 Transport of Water and Solutes in Plants	<p>First paragraph of subsec "Pressure Potential": "lb/in^{-2}" should probably be "lb/in^{-2}", as it is later in the equation. Also in pdf.</p>	Our reviewers accepted this change.	
Chapter 31.2	Link in footnotes doesn't work.	Update the URL to https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054277 .	Broken link
Chapter 31.3	<p>https://openstax.org/l/NRCS redirect is broken.</p> <p>Needs new link.</p>	This link will be updated.	Broken link
Chapter 32 Visual connection questions	<p>Question 1. is different from main article(PDF version, p.973). It should be consistent with the main article.</p> <p>https://openstax.org/books/biology-2e/pages/32-visual-connection-questions</p>	Revise the last two sentences in the question 1 stem to "What term is used to describe an incomplete flower lacking the androecium? What term describes an incomplete flower lacking a gynoecium?"	General/pedagogical suggestion or question
Chapter 32.1 Reproductive Development and Structure	<p>The caption to Figure 32.6 includes this sentence: "Each microsporangium contains hundreds of microspore mother cells that will each give rise to four pollen grains."</p> <p>Below that on the same page, it reads, "Within the microsporangium, the</p>	Revise "Within the microsporangium, the microspore..." to "Within the microsporangium, each of the microspore..."	General/pedagogical suggestion or question

	microspore mother cell divides by meiosis to give rise to four microspores, each of which will ultimately form a pollen grain." I don't believe both of these can be correct.		
Chapter 32.2 Summary	<p>Main article says " Self-pollination occurs when the pollen from the anther is deposited on the stigma of the same flower, or another flower on the same plant. Cross-pollination is the transfer of pollen from the anther of one flower to the stigma of another flower on a different individual of the same species."</p> <p>Chapter summary says "When the pollen of the flower is transferred to the stigma of the same flower, it is called self-pollination. Cross-pollination occurs when pollen is transferred from one flower to another flower on the same plant, or another plant."</p> <p>I think these statements contradict each other.</p> <p>https://openstax.org/books/biology-2e/pages/32-2-pollination-and-fertilization</p>	<p>Revise "...same flower, it is called self-pollination" to "...same or another flower on the same plant, it is called self-pollination".</p> <p>Also revise "...to another flower on the same plant, or another plant" to "...to another flower of another plant".</p>	General/pedagogical suggestion or question
Chapter 33.1	<p>For 33.1 Animal Form and Function as found https://cnx.org/contents/GFy_h8cu@11.5:RFA7VJpM@8/Animal-Form-and-Function The answer for the second free response question seems incorrect. The information in the text states: Smaller endothermic animals have a greater surface area for their mass than larger ones (Figure). Therefore, smaller animals lose heat at a faster rate than larger animals and require more energy to maintain a constant internal temperature. This results in a smaller endothermic animal having a higher BMR, per body weight, than a larger endothermic animal. The free response states: Basal Metabolic Rate is an expression of the metabolic processes that occur to maintain an individual's functioning and body temperature. Smaller bodied animals have a relatively large surface area compared to a much larger animal. The large animal's large surface area leads to increased heat loss that the animal must compensate for, resulting in a higher BMR. A small animal, having less relative surface area, does not lose as much heat and has a correspondingly lower BMR. This seems contradictory, and I believe the text is correct. Case# 28125</p>	<p>The correct answer will be updated.</p>	Incorrect answer, calculation, or solution
Chapter 33.1 Animal Form and Function	I think the final sentence of the "Limiting Effects of Diffusion on Size and	Revise "...the generation of dissipation of heat" to "...the	Typo

	Development" section (just before the Link to Learning box re: the zebrafish embryo) contains a typo: "... and the generation of dissipation of heat." should be "... and the generation and dissipation of heat."	generation and dissipation of heat."	
Chapter 33.1 Figure 33.6	<p>Figure 33.6 Vertebrate animals have two major body cavities. The dorsal cavity, indicated in green, contains the cranial and the spinal cavity. The ventral cavity, indicated in yellow, contains the thoracic cavity and the abdominopelvic cavity. The thoracic cavity is separated from the abdominopelvic cavity by the diaphragm. The thoracic cavity is separated into the abdominal cavity and the pelvic cavity by an imaginary line parallel to the pelvis bones. (credit: modification of work by NCI)</p> <p>", indicated in green," and ", indicated in yellow," are redundant. "The thoracic cavity" in the last sentence should be "The abdominopelvic cavity".</p> <p>https://openstax.org/books/biology-2e/pages/33-1-animal-form-and-function</p>	<p>Revise the caption to "Vertebrate animals have two major body cavities. The dorsal cavity contains the cranial and the spinal cavity. The ventral cavity contains the thoracic cavity and the abdominopelvic cavity. The thoracic cavity is separated from the abdominopelvic cavity by the diaphragm. The abdominopelvic cavity is separated into the abdominal cavity and the pelvic cavity by an imaginary line parallel to the pelvis bones. (credit: modification of work by NCI)"</p>	General/pedagogical suggestion or question
Chapter 33.1 Figure 33.9	The caption says "cells secrete mucous" instead of "secrete"	Our reviewers accepted this change.	Typo
Chapter 33.2	<p>In 33.2 Animal Primary Tissue as found https://cnx.org/contents/GFy_h8cu@11.5:-LfhWRES@5/Animal-Primary-Tissues I believe the first multiple choice review question should be A for squamous, not C for columnar.</p> <p>Case #28125</p>	The correct answer will be revised as indicated.	Incorrect answer, calculation, or solution
Chapter 33.3	<p>I take issue with the first paragraph, which defines various responses to environmental temperatures.</p> <p>Ectotherms Openstax: "Animals that do not control their body temperature are ectotherms." (But later in the same paragraph: "In contrast to ectotherms, which rely on external temperatures to set their body temperatures, poikilotherms are animals with constantly varying internal temperatures." This second definition is the more widely acceptable one.</p> <p>Endotherms Openstax: "Endotherms are animals that rely on internal sources for body temperature but which can exhibit extremes in temperature." This is a very confusing definition. What does it mean "exhibit extremes in temperature?" More acceptable – animal that generates most of its body heat by metabolic processes and can therefore maintain body temperature in the face of environmental temperature</p>	<p>Revise the first paragraph in this section to: Animals can be divided into two groups: some maintain a constant body temperature in the face of differing environmental temperatures, while others have a body temperature that is the same as their environment and thus varies with the environment. Animals that rely on external temperatures to set their body temperature are ectotherms. This group has been called cold-blooded, but the term may not apply to an animal in the desert with a very warm body temperature. In contrast to ectotherms, poikilotherms are animals with constantly varying internal temperatures. An animal that maintains a constant body temperature in the face of environmental changes is called a</p>	Other factual inaccuracy in content

	<p>fluctuations.</p> <p>Use of poikilotherm and homeotherm. The textbook really doesn't delineate very well between terms defining HOW animals regulate BT (ecto- and endotherm) and OBSERVED BT temperature variation (poikilotherm – exhibits wide variation in BT in response to variation in environmental temperature; homeotherm – exhibits constant BT). This is important because some animals live in environments which show very little variation in environmental temperature and therefore little variation in BT and can be described as ectothermic homeotherms (deep sea fish) vs. those animals that are endothermic homeotherms (mammals).</p>	<p>homeotherm. Endotherms are animals that rely on internal sources for maintenance of relatively constant body temperature in varying environmental temperatures. These animals are able to maintain a level of metabolic activity at cooler temperature, which an ectotherm cannot due to differing enzyme levels of activity. It is worth mentioning that some ectotherms and poikilotherms have relatively constant body temperatures due to the constant environmental temperatures in their habitats. These animals are so-called ectothermic homeotherms, like some deep sea fish species.</p>	
Chapter 35.3 Cerebral Cortex	<p>transmagnetic stimulation (TMS) Typo:transcranial magnetic stimulation(TMS)</p> <p>https://openstax.org/books/biology-2e/pages/35-3-the-central-nervous-system</p>	<p>Revise "transmagnetic stimulation" to "transcranial magnetic stimulation".</p>	Typo
Chapter 35.5 Link to Learning in Alzheimer's Disease	<p>Dead external link (leads to 404 page).</p>	<p>This link has been updated.</p>	Broken link
Chapter 36.3 Taste and Smell	<p>Above and below Figure 36.10: Circumvallate papillae is introduced twice, and each mention gives a different # of taste buds per papilla:</p> <ul style="list-style-type: none"> • Final paragraph of p. 1039: "The large circumvallate papillae contain up to 100 taste buds and form a V near the posterior margin of the tongue." • First paragraph of p. 1040: "Finally, there are circumvallate papillae, which are wall-like papillae in the shape of an inverted "V" at the back of the tongue. Each of these papillae is surrounded by a groove and contains about 250 taste buds." 	<p>Revise "100 taste buds" to "250 taste buds".</p>	Other factual inaccuracy in content
Chapter 37.2 How Hormones Work	<ul style="list-style-type: none"> • On p. 1157 (Chap. 37.1), the text lists thyroxine as an amino acid-derived hormone (see final paragraph on page). • On p. 1160 (Chap. 37.2, directly below Visual Connection box), the text says that thyroxine is lipid-soluble: "Other lipid-soluble hormones that are not steroid hormones, such as vitamin D and thyroxine ..." • However, on p. 1160 it also says, "Amino acid derived hormones and polypeptide hormones are not lipid-derived (lipid-soluble) and therefore cannot diffuse through the plasma membrane of cells." <p>The information about thyroxine on p. 1157</p>	<p>Revise "The hormones diffuse across both the plasma membrane and the nuclear envelope, then bind to receptors in the nucleus" to "While thyroxine is mostly hydrophobic, its passage across the membrane is dependent on transporter protein. Vitamin D diffuses across both the plasma membrane and the nuclear envelope. Once in the cell, both hormones bind to receptors in the nucleus."</p> <p>Also revise to "Amino acid derived hormones and polypeptide</p>	General/pedagogical suggestion or question

	seems inconsistent with the information on p. 1160.	hormones are..." to "Amino acid-derived hormones (with the exception of thyroxine) and polypeptide hormones are..."	
Chapter 38.2	The red bone marrow of the femur and the interior of other large bones, such as the ileum, forms blood cells. Typo: "ileum" to "ilium" https://openstax.org/books/biology-2e/pages/38-2-bone	Revise "ileum" to "ilium".	Typo
Chapter 38.4 Muscle Contraction and Locomotion (https://cnx.org/contents/jVCgr5SL@8.202:9kpMgMgT@4/Muscle-Contraction-and-Locomot)	Question says "acetylcholinesterase", it looks like it should be "Acetylcholinesterase". Duplicated from book report (affects ISM too) - nicolas	Our reviewers accepted this change.	Typo
Chapter 39.1	In Figure 39.5 of Biology 2e, the labels and coloring of blood flow through the gill lamellae are reversed in the rightmost part of the figure. Specifically, oxygen-poor (blue) blood should enter at the left and oxygen-rich (red) blood should exit at the right. The arrows are all correct. Submitted to Customer Support, Case 00031566	This figure will be updated.	Other factual inaccuracy in content
Chapter 39.2	The pie graph showing gas pressures for venous blood is incorrectly labeled. The label for partial pressure of O ₂ points to the blue portion of the pie but it should point to the red portion of the pie. The label for partial pressure of CO ₂ points to the red portion of the pie, but it should point to the blue portion of the pie.	This figure will be updated.	Typo
Chapter 4.3: Figures 4.11, 4.15; Ch 26.1: Evolution of Seed Plants, Figure 26.7	Three Biology (majors) images are missing alt text: 4.11, 4.15, and 26.7. Over the scope of the entire textbook, this is a very small quantity to be missed, but if we can improve, we should. Two suggestions are included below, which need to be verified and improved. The third (figure 26.7) was not provided. (Please check Concepts, too.) Figure 4.11: The two-dimensional image depicts the nucleus of a cell as a circular object; several gaps appear in the circle, representing nuclear pores. Surrounding the nucleus are bands of material representing the endoplasmic reticulum. Inside the nucleus are several other structures. These include a circle approximately ten percent of the total size of the nucleus, representing the nucleolus. 4.15: The image depicts two tubes, one on top of the other, at right angles. The central space	Add alt text for images 4.11, 4.15, and 26.7. For Figure 4.11, correct brackets so that they span the width of the centriole.	Other

	within the tubes is labeled as the centriole. Each tube is surrounded by smaller tubes grouped in threes; these are labeled "microtubule triplet."		
Chapter 40.3	https://openstax.org/l/electric_heart redirect is broken. Needs new link.	This link will be updated in Biology 2e.	Broken link
Chapter 41.5	Upper left "angiotensin" Typo: angiotensinogen (see Fig.37.7) https://openstax.org/books/biology-2e/pages/41-5-hormonal-control-of-osmoregulatory-functions	This figure will be updated.	Typo
Chapter 42 Question 12	In the section "Adaptive Immune Response" of the Biology textbooks, the question below: A memory B cell can differentiate upon re-exposure to a pathogen of which cell type? CTL naïve B cell memory T cell plasma cell Provides the answer of D. I think the question is worded improperly. The question seems to be asking for a cell type of the pathogen, when the answer indicates the question should be asking about the cell type the memory cell changes to. So I suggest the question should be worded as "Upon re-exposure to a pathogen, a memory B cell can differentiate to which cell type?"	Revise the question stem to "Upon reexposure to a pathogen, a memory B cell can differentiate to which cell type?"	Other factual inaccuracy in content
Chapter 43 Visual Connection Questions	Question 1. is different from main article(PDF version, p.1380). It should be consistent with the main article. https://openstax.org/books/biology-2e/pages/43-visual-connection-questions	Add the following to the end of question 1: "Think of the variation, or lack of variation, in seasonal temperature change."	General/pedagogical suggestion or question
Chapter 43.4	First review question solution is wrong. Question: Which hormone causes Leydig cells to make testosterone? A: FSH; B: LH; C: inhibin; D: estrogen. Solution shows A (FSH) when it should be B (LH). The error also appears in the updated version.	The correct answer will be updated as indicated.	Incorrect answer, calculation, or solution
Chapter 43.6 Fertilization and Early Embryonic Development - Cleavage and Blastula Stage	Link to Learning ("http://openstaxcollege.org/l/human_embryo") - update link to https://www.prenatalorigins.org/virtual-human-embryo/	Our reviewers accepted this change.	

Chapter 43.7	See the attached snip, which says that the somites develop into the lungs. I think the lungs arise from endoderm, and the somites are mesodermal. Connective tissue derived from the somites may line the outside of the lung epithelium, but I'm pretty sure the breathing surface is endodermal.	Revise the sentence beginning "The somites, illustrated..." to "The somites illustrated in Figure 43.29 will further develop into the cells that form the vertebrae and ribs, the dermis of the dorsal skin, the skeletal muscles of the back, and the skeletal muscles of the body wall and limbs."	Other factual inaccuracy in content
Chapter 44.3	. The average winter temperature is -34 °C (29.2 °F) I think you are missing a neg sign in the Fahrenheit conversion.	Thank you for your submission. This edit has been made and will be reflected on the web version of the book: https://cnx.org/contents/jVCgr5SL@14.28:xiJu444u/Terrestrial-Biomes	Typo
Chapter 44.4	my friends and I were studying and we think that one of your question answers may be incorrect, specifically the art connection question on chapter 44.4. The question asks for what ocean zones contain photosynthetic life. We believe the answer is B however the online book answer is C. We do not believe C is the correct answer because this answer contains the abyssal zone in it. The abyssal zone contains no light what at all which leads to my confusion on how it might support photosynthetic life. Thanks for reading!	Revise the solution to Art Connection Question 3 Figure 44.21 to "B. Photosynthetic organisms would be found in the photic zone, the intertidal zone, the neritic zone, and the oceanic zone."	Other factual inaccuracy in content
Chapter 45.5 Human Population Growth	Statement " According to the World Health Organization, global death from infectious disease declined from 16.4 million in 1993 to 14.7 million in 1992" carries wrong dates.	Revise "According to the World Health Organization, global death from infectious disease declined from 16.4 million in 1993 to 14.7 million in 1992" to "According to the Institute for Health Metrics and Evaluation (IHME) in Seattle, global death from infectious disease declined from 15.4 million in 1990 to 10.4 million in 2017." Also revise "0.24 percent" to "0.14 percent".	Other factual inaccuracy in content
Chapter 45.6	The section in the ecology chapter 45, section 45.6. It talks about camouflage, and how chameleons can change their color based on their background. This is false information, as chameleons cannot change their color based on background. They change color based on a number of things like mood, health and body temperature. Yes, their coloring can help with their camouflage, but the chromatophores in their flesh can only show certain colors. A green veiled chameleon wont turn pink, just because you put it in a pink box. I would suggest changing the example in this section from chameleons, to something like an octopus or a cuddle fish.	Revise "In another example, the chameleon can change..." to "In another example, the chameleon can, within limitations, change..."	Other factual inaccuracy in content

Chapter 45.6 Community Ecology	<p>The textbook indicates "Another example of a commensal relationship is the clown fish and the sea anemone. The sea anemone is not harmed by the fish, and the fish benefits with protection from predators who would be stung upon nearing the sea anemone."</p> <p>However, the clownfish/anemome (and anemonefish/anemone) association is mutualism - both gain protection from predators (plus other benefits). The mutualism is responsible for the radiation of clownfish. For example see the following papers: https://bmcevolbiol.biomedcentral.com/articles/10.1186/1471-2148-12-212 and https://jeb.biologists.org/content/216/6/970.</p>	Revise the last two sentences in this paragraph to "Another example of a commensal relationship is the pilot fish and the shark. The pilot fish feed on the leftovers of the host's meals, and the host is not affected in any way."	Other factual inaccuracy in content
Chapter 46.1	<p>The numbers in figure 46.8 are incorrect. For example, $13187 + 2265 + 272 + 16 + 5060 = 20800$ and $4250 + 720 + 90 + 5 = 5065$ and $13187 + 7618 = 20805$. Therefore, the numbers in P.1469 and P.1470 should also be reconsidered.</p> <p>https://openstax.org/books/biology-2e/pages/46-1-ecology-of-ecosystems</p>	This figure will be updated.	Other factual inaccuracy in content
Chapter 46.3	<p>The carbon cycle pictured in Figure 46.15 shows an arrow from the atmosphere down to the text that is in the ocean as "Marine Respiration", and the arrow leaving the ocean going to the atmosphere next to "Marine photosynthesis". Each of these arrows goes the wrong direction and shows the flow of carbon in the opposite direction that it is actually flowing. The fix is to switch the arrows.</p>	This issue was addressed in another report and is correct in webview.	Other
Chapter 46.3	<p>Atmospheric sulfur is found in the form of sulfur dioxide (SO₂), and as rain falls through the atmosphere, sulfur is dissolved in the form of weak sulfuric acid (H₂SO₄).</p> <p>Previously, your reviewers found this statement correct, which is, sadly, is wrong from the chemical standpoint. SO₂ dissolves in water forming sulfurous (H₂SO₃), not sulfuric acid. Eventually H₂SO₃ may get oxidized forming H₂SO₄, but the latter is by no means a weak acid. For the chemistry's sake, correct this mistake.</p>	Revise "sulfuric" to "sulfurous" and revise "H ₂ SO ₄ " to "H ₂ SO ₃ ".	Other factual inaccuracy in content
Chapter 47 Visual Connection Questions	<p>Question 3. does not correspond to main article. It should be replaced to REVIEW QUESTIONS.</p> <p>https://openstax.org/books/biology-2e/pages/47-visual-connection-questions</p>	Our reviewers determined that because this would cause a numbering discrepancy between the PDF and webview, we cannot make this change at this time. We will make the change in future editions of this book.	General/pedagogical suggestion or question

Chapter 47 Visual Connection Questions #3	Question 3 looks like it should be in the Review Questions section, but it is in the Visual Connection section. Also, the answer given in the IAG isn't an option given in the 2e PDF	This question will be moved to the Review Questions section.	General/pedagogical suggestion or question
Chapter 47.3	<p>The legend to Fig. 47.15 contains mistakes. The area in light brown is not the bear's extended range following climate change. Rather, the light brown is where grizzly bears occurred historically and have persisted.</p> <p>I have attached a screenshot comparing the OpenStax map with one from https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/grizzly-bear-2012.html (Fig. 2). In that map, you'll see that the range expansion of grizzlies is in the far north (in pink in the map)</p>	This figure will be updated.	Other factual inaccuracy in content